

# Trainer's Guide

## Module 6.2.2

Complex communication means



**Presenter's name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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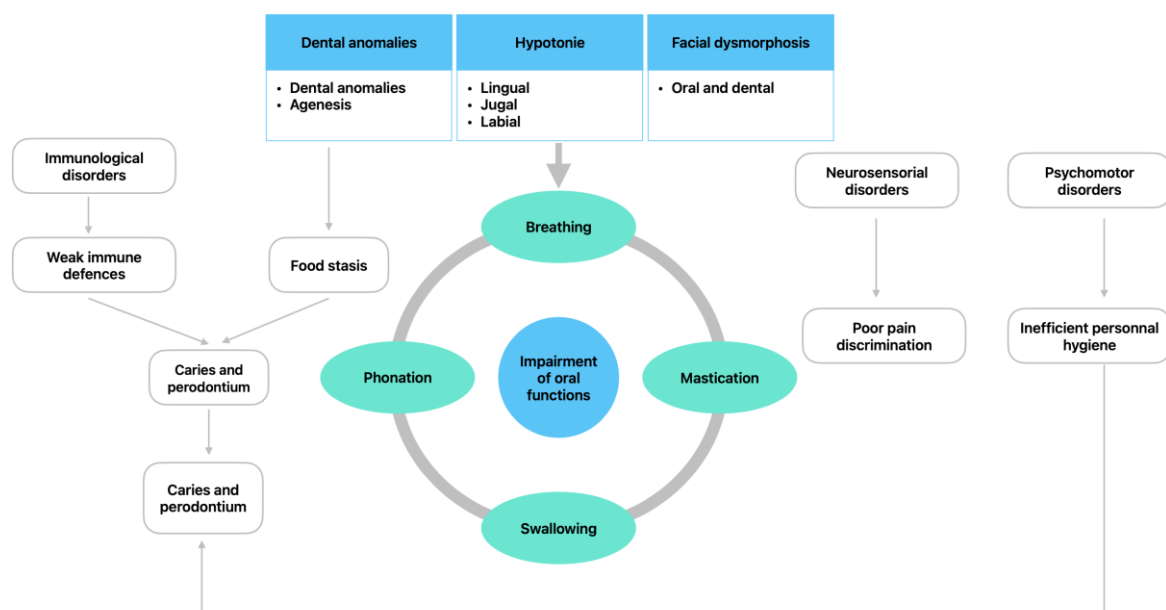


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# 1.Introduction

## Phonology and articulation

Speech and language, in IDD is often marked by a lack of intelligibility, especially when oro-facial anomalies are present as it is the case in Down's syndrome and in many genetic syndromes. The following Figure adapted from (Faye et al., 2004) illustrated the bucco-facial syndrome which is often associate with syndromic IDD conditions.



Without going into detail, the presence of oral-facial syndrome also has a major impact on people's health.

- Dental anomalies, food deposits due to poor dental hygiene and immunological problems all contribute to the development of cavities.
- Hypotonia of the facial structures can lead to feeding problems (for example, sucking problems in infants) and sometimes to food selectivity.
- The narrowness of the palate and the oral cavity in general alters the resonance cavities and thus affects the quality of speech sounds.
- The hypotonia of the tongue associated with relative macroglossia in people with Down's syndrome also has an impact on the quality of speech sounds and contributes to a lack of intelligibility.

Let's return to the intelligibility of speech. While it is largely influenced, as we have just seen, by the morphological characteristics of the face, i.e. the characteristics of the speaker, it is also

dependent on the context of production (for example, in a situation of stress, excitement, etc.) and on the receiver (i.e. these auditory capacities).

It is not unusual for hearing problems to be added to an already gloomy picture (for example, in people with Down's syndrome, it is present in 2/3 of cases). Depending on the extent of the hearing loss and whether it is unilateral or bilateral, communication and understanding of language will be affected. The following table shows the impact of hearing loss on language development and in everyday life (IBA classification: International Bureau of Audiophonology)

Loss	Classification	Consequences	
<b>10-40dB</b>	Mild	Mispronunciation of consonants Difficulties at school	Language acquired spontaneously but imperfectly
<b>40-70dB</b>	Moderate	Late language onset Numerous phoneme mix-up	
<b>70-90dB</b>	Severe	Noise identification Perception of loud voice	
<b>&gt;90dB</b>	Profound	No speech is perceived	Language not spontaneously acquired

The challenge for language development will be to identify the presence of hearing loss as early as possible and to determine its extent. These factors are essential if the person is to receive appropriate care. Unfortunately, the presence of an IDD does not facilitate the medical approach to hearing assessment. Briefly, as much as the extent of the hearing loss, the time of onset is decisive for the developmental prognosis. The earlier the hearing loss, the greater the impact on speech and language development.

In people with Down's syndrome, intelligibility is also strongly affected by voice characteristics, in particular hoarseness, anatomical anomalies influencing the volume of the resonance cavities, fluency disturbances, frequent articulatory disorders and prosodic characteristics (Kent & Vorperian, 2013). Intelligibility increases with chronological age; progress is most marked between the ages of 4 and 16. More specifically, children with Down's syndrome aged 4 to 7 are less intelligible overall than children of the same chronological age and sex. Thus, 100% of boys and 95% of girls with Down's syndrome under the age of 14 are difficult to understand. Over the age of 14, 74% of boys and only 49% of girls are less intelligible than children of the general population aged 6-7.

While, as we have already discussed, the correct production of speech sounds is often impaired in IDD (notably due to facial dysmorphism and hypotonia of the facial muscles), other language components are also affected.

here is a delay of around 2 months in the onset of babbling, i.e. the production of syllables involving the combination of sounds (Lynch et al., 1995). The production of consonant-vowel syllables appears at around 9 months in babies with Down's syndrome, whereas it can already be observed at around 7 months in children of normal age. This syllable reduction is not only delayed compared with the typical child, but is also less stable (Lynch et al., 1995) due to the hypotonia of the orofacial sphere described above. This hypotonia reduces the speed and precision of articulatory movements (Dodd & Thompson, 2001; Stoel-Gammon, 1997). Despite considerable inter-individual variability, subsequent word production is generally marked by deletion of unstressed syllables, reduction of consonant clusters, substitution, omission or addition of phonemes. These various errors, which generally tend to simplify production, are still present in adulthood (Dodd & Thompson, 2001).

## Bibliography

Dodd, B., & Thompson, L. (2001). Speech disorder in children with Down's syndrome. *Journal of Intellectual Disability Research*, 45(4), 308-316. <https://doi.org/10.1046/j.1365-2788.2001.00327.x>

Faye, M., Hennequin, M., Yam, A. A., & Ba, I. (2004). [Evaluation of oral health and access to care in senegalese children with Down syndrome : Preliminary study]. *Dakar medical*, 49(1), 64-69.

Kent, R. D., & Vorperian, H. K. (2013). Speech Impairment in Down Syndrome : A Review. *Journal of Speech Language and Hearing Research*, 56(1), 178. [https://doi.org/10.1044/1092-4388\(2012/12-0148\)](https://doi.org/10.1044/1092-4388(2012/12-0148))

Lynch, M. P., Oller, D. K., Steffens, M. L., & Buder, E. H. (1995). Phrasing in prelinguistic vocalizations. *Developmental Psychobiology*, 28(1), 3-25. <https://doi.org/10.1002/dev.420280103>

Stoel-Gammon, C. (1997). Phonological development in Down syndrome. *Mental Retardation and Developmental Disabilities Research Reviews*, 3(4), 300-306. [https://doi.org/10.1002/\(SICI\)1098-2779\(1997\)3:4<300::AID-MRDD4>3.0.CO;2-R](https://doi.org/10.1002/(SICI)1098-2779(1997)3:4<300::AID-MRDD4>3.0.CO;2-R)



## **2.Materials Needed**

The slides for this presentation (COM-IN\_PR3\_6\_2\_2\_Phonology and articulation\_EN.pptx)

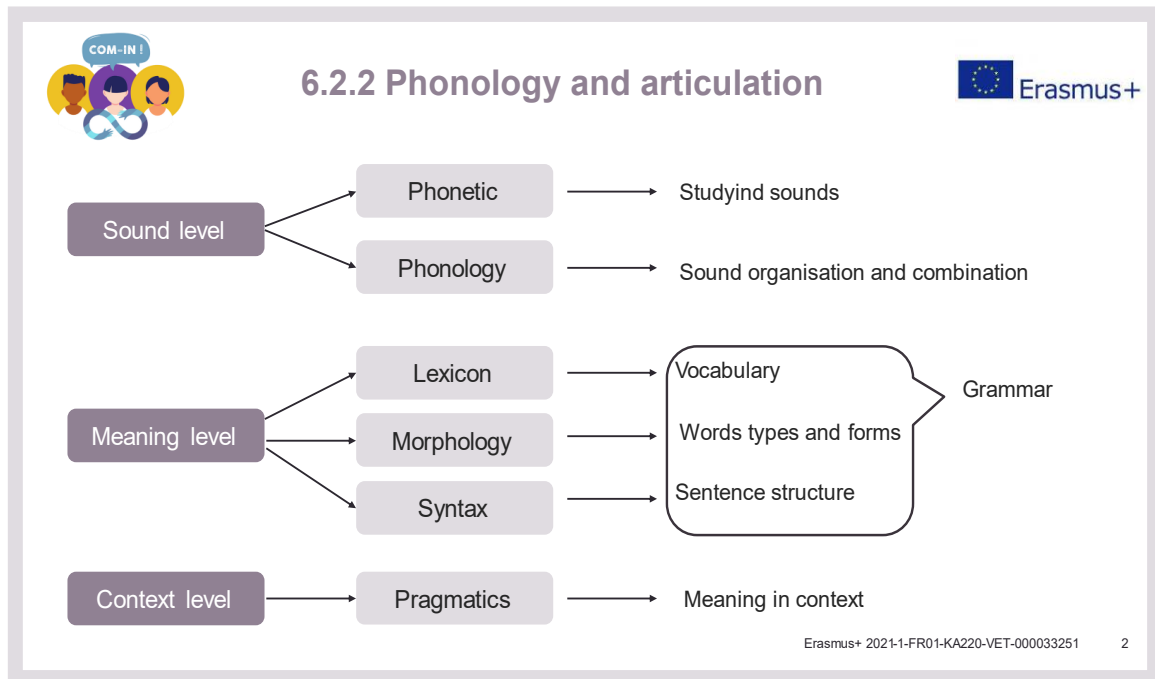
A Video projector



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### 3.Slides and Content

#### Slide n°2



#### Content:

We are at the level of the production and discrimination of speech sounds.

The quality of sound production is often impaired. Sounds are imprecise, distorted or, in the case of certain complex sounds, absent from the phonemic repertoire of people with IDD.

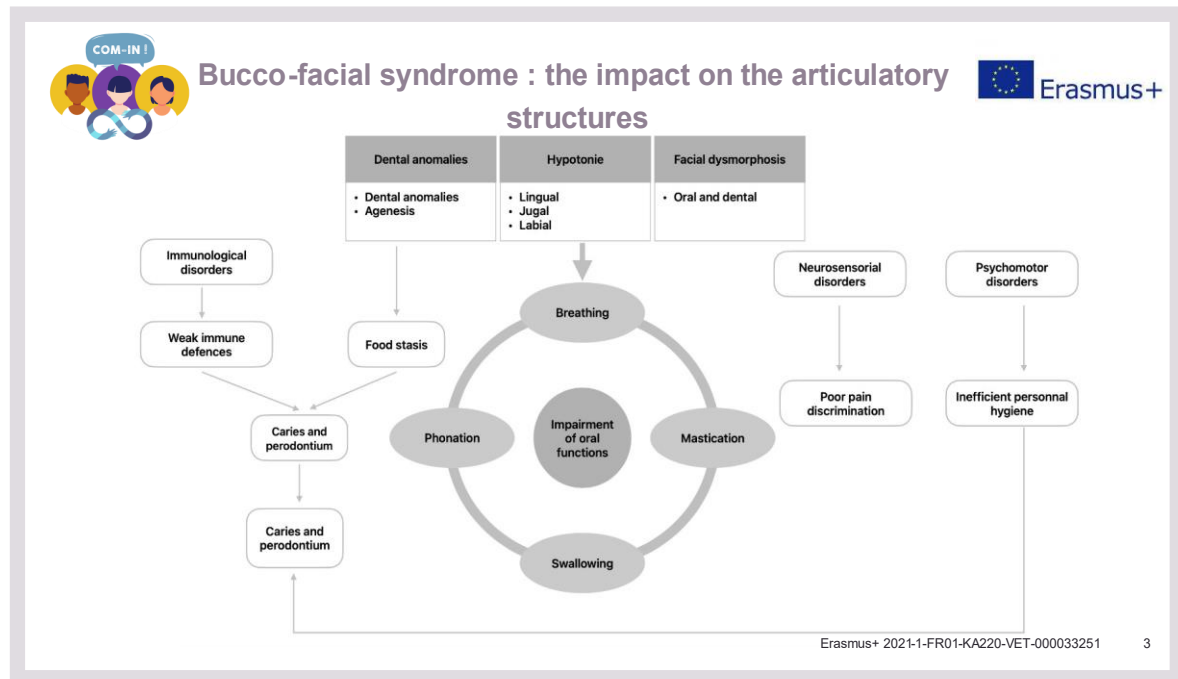
The consequence will be a delay in the emergence of babbling and the first combinations of sounds allowing the formation of syllables.

Good discrimination is often hampered by more or less significant hearing loss.

#### Notes :



## Slide n°3



## Content:

Speech and language, in IDD is often marked by a lack of intelligibility, especially when oro-facial anomalies are present as it is the case in Down's syndrome and in many genetic syndromes.

The present Figure adapted from (Faye et al., 2004) illustrated the bucco-facial syndrome which is often associate with syndromic IDD conditions

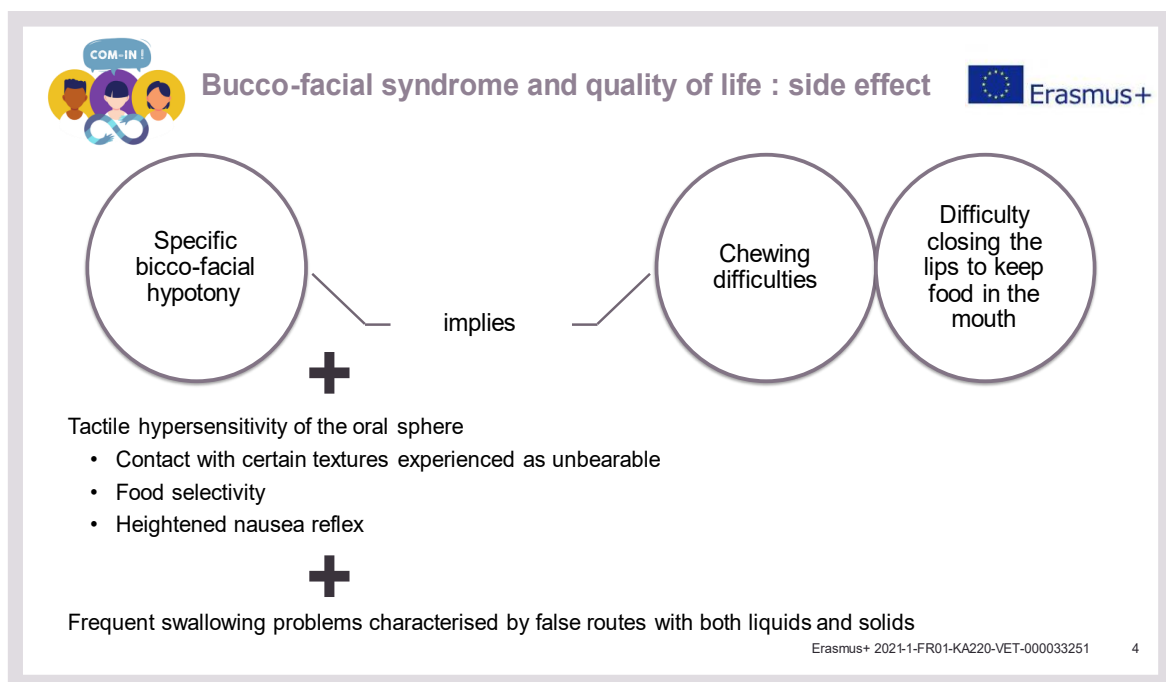
- Hypotonia of the facial structures can lead to feeding problems (for example, sucking problems in infants) and sometimes to food selectivity.
- The narrowness of the palate and the oral cavity in general alters the resonance cavities and thus affects the quality of speech sounds.



- The hypotonia of the tongue associated with relative macroglossia in people with Down's syndrome also has an impact on the quality of speech sounds and contributes to a lack of intelligibility.

**Notes :**

## Slide n°4



## Content:


Without going into detail, the presence of oral-facial syndrome also has a major impact on people's health.

- Dental anomalies, food deposits due to poor dental hygiene and immunological problems all contribute to the development of cavities.


- Hypotonia of the facial structures can lead to feeding problems (for example, sucking problems in infants) and sometimes to food selectivity


**Notes :**

## Slide n°5



### Frequent hearing loss





Loss	Classification	Consequences	
10-40dB	Mild	Mispronunciation of consonants Difficulties at school	Language acquired spontaneously but imperfectly
40-70dB	Moderate	Late language onset Numerous phoneme mix-up	
70-90dB	Severe	Noise identification Perception of loud voice	
>90dB	Profound	No speech is perceived	Language not spontaneously acquired

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## Content:

Let's return to the intelligibility of speech. While it is largely influenced, as we have just seen, by the morphological characteristics of the face, i.e. the characteristics of the speaker, it is also dependent on the context of production (for example, in a situation of stress, excitement, etc.) and on the receiver (i.e. these auditory capacities).

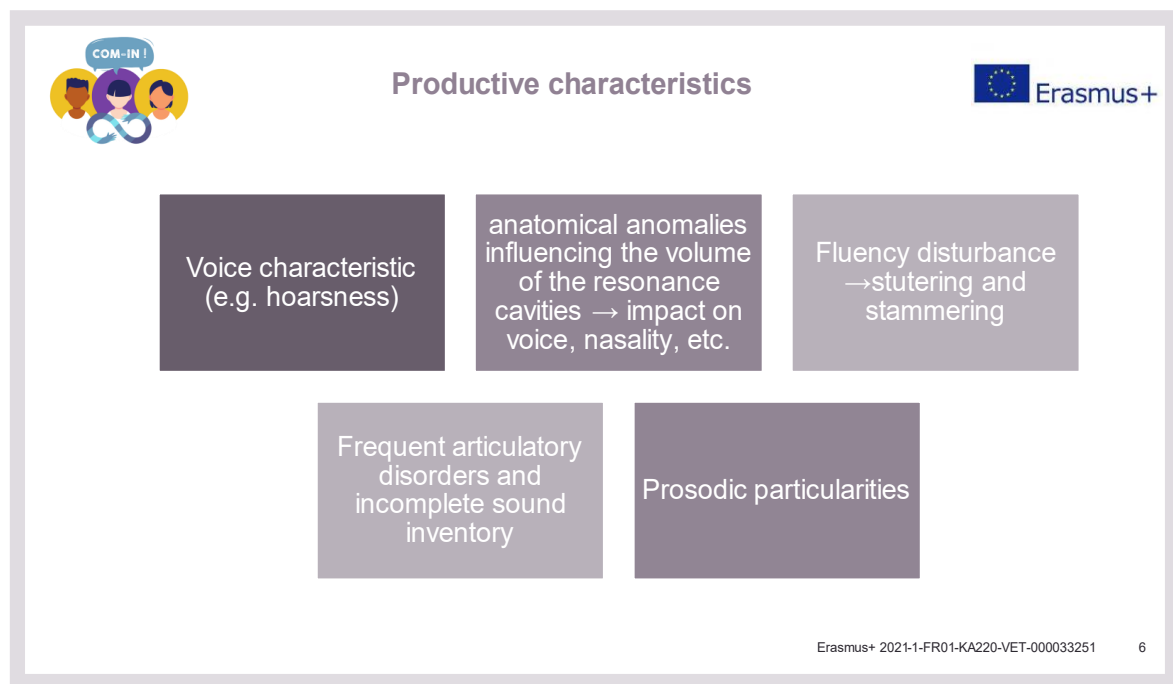
It is not unusual for hearing problems to be added to an already gloomy picture (for example, in people with Down's syndrome, it is present in 2/3 of cases). Depending on the extent of the hearing loss and whether it is unilateral or bilateral, communication and understanding of language will be affected. The following table shows the impact of hearing loss on language development and in everyday life (IBA classification: International Bureau of Audiophonology)

The challenge for language development will be to identify the presence of hearing loss as early as possible and to determine its extent. These factors are essential if the person is to receive appropriate care. Unfortunately, the presence of an IDD does not facilitate the medical approach to hearing assessment. Briefly, as much as the extent of the hearing loss, the time of onset is decisive for the developmental prognosis. The earlier the hearing loss, the greater the impact on speech and language development.

**Notes :**



## Slide n°6



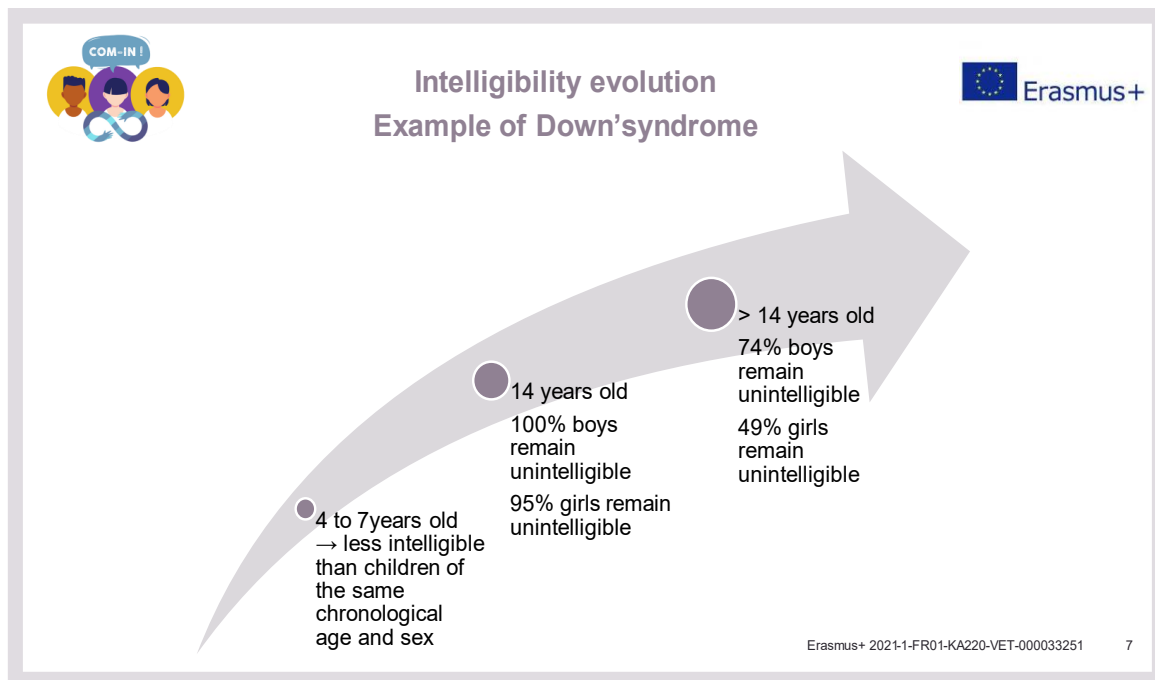
### Content:

In people with Down's syndrome, intelligibility is also strongly affected by voice characteristics, in particular hoarseness, anatomical anomalies influencing the volume of the resonance cavities, fluency disturbances, frequent articulatory disorders and prosodic characteristics (Kent & Vorperian, 2013).

### Notes :



## Slide n°7



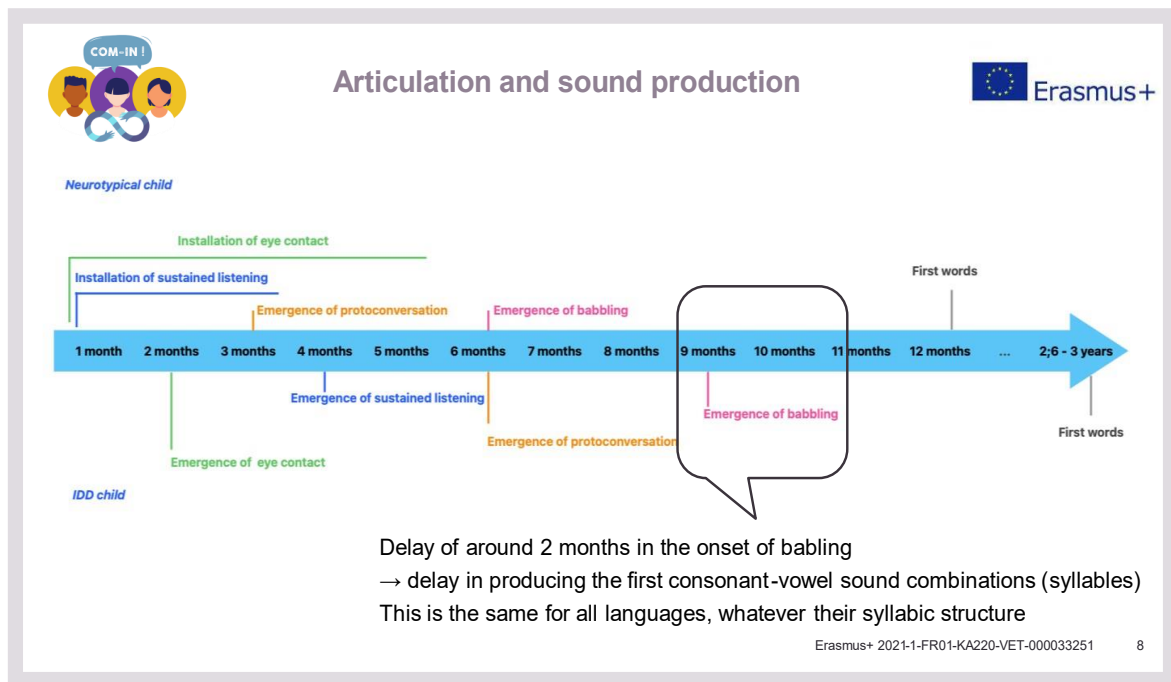
### Content:

Intelligibility increases with chronological age; progress is most marked between the ages of 4 and 16. More specifically, children with Down's syndrome aged 4 to 7 are less intelligible overall than children of the same chronological age and sex. Thus, 100% of boys and 95% of girls with Down's syndrome under the age of 14 are difficult to understand. Over the age of 14, 74% of boys and only 49% of girls are less intelligible than children of the general population aged 6-7.

### Notes :



## Slide n°8



### Content:

There is a delay of around 2 months in the onset of babbling, i.e. the production of syllables involving the combination of sounds (Lynch et al., 1995).

The production of consonant-vowel syllables appears at around 9 months in babies with Down's syndrome, whereas it can already be observed at around 7 months in children of normal age. This syllable reduction is not only delayed compared with the typical child, but is also less stable (Lynch et al., 1995) due to the hypotonia of the orofacial sphere described above.


This hypotonia reduces the speed and precision of articulatory movements (Dodd & Thompson, 2001; Stoel-Gammon, 1997). Despite considerable inter-individual variability, subsequent word production is generally marked by deletion of unstressed syllables, reduction of consonant clusters, substitution,




omission or addition of phonemes. These various errors, which generally tend to simplify production, are still present in adulthood (Dodd & Thompson, 2001).

**Notes :**

## Slide n°9



### Bibliography



Dodd, B., & Thompson, L. (2001). Speech disorder in children with Down's syndrome. *Journal of Intellectual Disability Research*, 45(4), 308-316. <https://doi.org/10.1046/j.1365-2788.2001.00327.x>

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Lynch, M. P., Oller, D. K., Steffens, M. L., & Buder, E. H. (1995). Phrasing in prelinguistic vocalizations. *Developmental Psychobiology*, 28(1), 3-25. <https://doi.org/10.1002/dev.420280103>

Stoel-Gammon, C. (1997). Phonological development in Down syndrome. *Mental Retardation and Developmental Disabilities Research Reviews*, 3(4), 300-306. [https://doi.org/10.1002/\(SICI\)1098-2779\(1997\)3:4<300::AID-MRDD4>3.0.CO;2-R](https://doi.org/10.1002/(SICI)1098-2779(1997)3:4<300::AID-MRDD4>3.0.CO;2-R)

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**Content:**

**Notes :**